

REMARKS

Reconsideration of the above-referenced application in view of the following remarks is respectfully requested.

Claims 1-13 are pending in this case. Claims 4 and 11 are amended herein to correct punctuation.

The Examiner rejected claims 1 and 8 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner argues that the specification does not teach etching of a metal stack and resistor material to form a plurality of metal lines in addition to and separate from a thin film resistor area. FIGs. 1, 2D-2F of the instant application clearly show 3 metal lines 70. Metal lines 70 are shown as the third metal interconnect level. Portions of metal lines 70 (e.g., the left two) serve as resistor contacts 64 and 66 (page 5, lines 10-14). The right most metal line 70 is in addition to and separate from resistor 60. As described in the paragraph bridging pages 6 and 7, a mask 78 covers portions of the metal stack 76 where metal lines 70 are desired. The exposed portions of the metal stack 76 and resistor material 62 are then removed using a dry etch. The mask 76 is removed as the resulting structure is shown in FIG. 2D. The etching of metal stack 76 and resistor material 62 forms metal lines 70 including the right most metal line 70 which is in addition to and separate from the resistor area. Furthermore, at page 7, lines 17-20, the specification teaches that the same metal stack used to form a metal interconnect level is used to form connections to the thin film resistor. Accordingly, Applicant respectfully submits that the subject matter of claims 1

and 8 is described in the specification in such a way so as to reasonably convey to one skilled in the art that the inventors has possession of the claimed invention. Applicant requests that the rejection be withdrawn.

The Examiner rejected claims 1 and 8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner argues it is unclear how the metal lines are formed so they are in addition to and separate from the thin film resistor area. Claim 1 recites "etching said metal stack and said layer of resistor material using said first pattern to form a plurality of metal lines in addition to and separate from a thin film resistor area". The metal stack and resistor material are etched using a pattern. As shown in FIGs. 2C and 2D and explained in the specification from page 6 line 23 to page 7 line 10, the metal stack 76 and resistor material 62 are etched using a pattern 78 to create the right most metal line 70, which is in addition to and separate from the resistor area. Claim 8 even further describes the pattern. No further recital is necessary to particularly point out and distinctly claim that which Applicant regards as the invention. Accordingly, claims 1 and 8 particularly point out and distinct claim the subject matter which Applicant regards as the invention.

The Examiner argues that there is insufficient antecedent basis for "a thin film resistor" at lines 8, 9 of claim 1. At lines 8, 9 of claim 1, "a thin film resistor area" is recited. That is the first instance of that term in the claim and consequently, the term "a" before the term is proper.

The Examiner argues that there is insufficient antecedent basis for "said thin film resistor" in line 7 of claim 8. Antecedent basis is found in the preamble, line 1 of claim 8.

In light of the above, Applicant requests that the rejection be withdrawn.

The Examiner rejected claims 1-3, 7 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under § 103(a) as being obvious over Ishii (U.S. 5,422,307).

Applicant respectfully submits that claim 1 is unanticipated by and patentable over Ishii as there is no disclosure or suggestion in Ishii of etching a metal stack and a layer of resistor material using a first pattern to form a plurality of metal lines in addition to and separate from a thin film resistor area. Ishii teaches forming a resistor by depositing a layer of resistor material and a metal stack, using a first pattern to etch the metal stack and resistor layer, and using a second pattern to etch the metal stack from over a high resistance area of the resistor layer. This leaves peripheral wiring at the ends of the resistor. There is no disclosure or suggestion in Ishii of forming a plurality of metal lines in addition to and separate from the resistor area. The only wiring taught by Ishii is the peripheral wiring of the resistor itself. No additional wiring is taught or suggested.

The Examiner first argues metal lines would inherently be formed in addition to and separate from the thin film resistor area. This is not correct. Metal lines in addition to and separate from the thin film resistor area would only be formed if the pattern for the etch was modified so as to allow the additional metal lines to be formed. Whether additional metal lines are formed depends on the shape of the pattern, and thus, the additional metal lines are not inherent.

The Examiner further argues that there is always more than one metal line formed during the fabrication of an integrated circuit so it would be obvious to form metal lines in addition to and separate from the thin film resistor area. Applicant admits that in a metal interconnect level multiple metal lines are typically formed. However, Ishii does not teach that its resistor is formed as part of a metal interconnect level. A metal stack is used in Ishii for the resistor

heads/contacts, but there is no disclosure or suggestion that this metal stack is part of a metal interconnect level where other wiring would exist. Conventionally, thin film resistors are formed between metal interconnect levels. In hindsight, after reviewing the Applicant's specification, it would be obvious to make the resistor of Ishii part of a metal interconnect level and have additional and separate metal lines, but it is improper to use hindsight in rejecting the claims. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are unanticipated by and unobvious over Ishii.

The Examiner rejected claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Ishii as applied to claim 1, and further in view of Morris (U.S. 5,485,138).

Applicant respectfully submits that claim 6 is patentable for the reasons discussed above relative to claim 1, from which it depends.

The Examiner rejected claims 8-10, 12, 13 under 35 U.S.C. § 103(a) as being unpatentable over Ishii, Linn, and Morris.

Applicant respectfully submits that claim 8 is patentable over the combined references as there is no disclosure or suggestion in the references of dry etching a metal stack and a layer of resistor material using a first pattern to form a plurality of metal lines in addition to and separate from the thin film resistor. Ishii teaches forming a resistor by depositing a layer of resistor material and a metal stack, using a first pattern to etch the metal stack and resistor layer, and using a second pattern to etch the metal stack from over a high resistance area of the resistor layer. This leaves peripheral wiring at the ends of the resistor. The only wiring taught by Ishii is the peripheral wiring of the resistor itself. No additional wiring is taught or suggested. Additional metal lines are neither inherent nor obvious for the reasons discussed above relative to claim 1.

Morris is applied to teach vias. Lynn is applied to teach the desire to etch the metal without affecting the resistor material. There is no disclosure or suggestion in the combined references of forming a thin film resistor and a plurality of metal lines in addition to and separate from the resistor from the same metal stack. Accordingly, Applicant respectfully submits that claim 8 and the claims dependent thereon are patentable over the references.


The Examiner rejected claims 4, 5, 11 under 35 U.S.C. § 103(a) as being unpatentable over Ishii, or Ishii/Linn/Morris as applied to claims 1 and 8, and further in view of admitted prior art.

Applicant respectfully submits that claims 4, 5, and 11 are patentable over the references for the same reasons discussed above relative to claims 1 and/or 8, from which these depend.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-13. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

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Respectfully submitted,



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